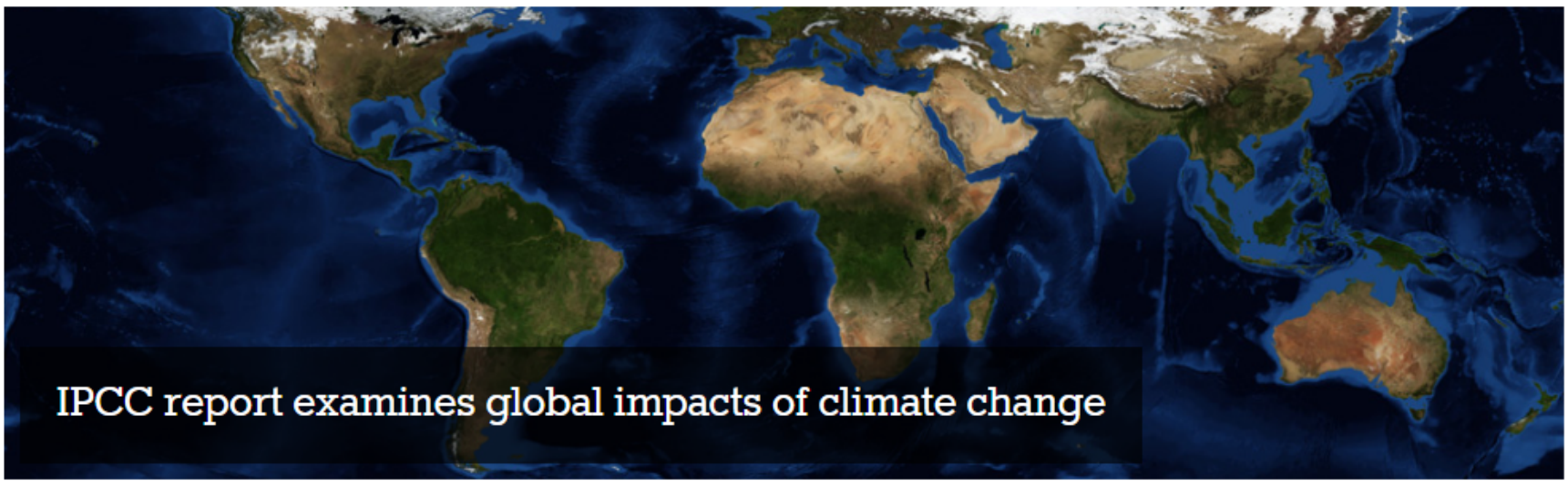

13 April 2014 - A new report from the Intergovernmental Panel on Climate Change (IPCC) examines how society might reduce future greenhouse gas emissions to avoid the most dangerous changes in climate.

This is the third volume of its fifth assessment report (AR5) of climate and climate change. It follows Working Group I , which explored the evidence for climate change, and Working Group II , which looked at current and future impacts of a warming world.

Working Group III (WGIII) focuses on how manmade emissions of greenhouse gases have changed over recent decades and discusses how future increases in warming might be avoided. More than 400 authors and almost 900 reviewers from around the globe have worked on the assessment.

The report finds that global manmade emissions of greenhouse gases have continued to rise. For the most important gas, carbon dioxide, concentrations in the atmosphere were about 280 parts per million before the industrial revolution in the 1700s. For the first time in human history, the concentration is now surpassing 400 parts per million - higher than at any time in at least the last 800,000 years.

International governments have agreed that to avoid the risk of potentially dangerous impacts, society should try to limit global surface warming to no more than 2° C above pre-industrial levels.

Research in WGIII and by the Met Office led AVOID programme in the UK, funded by DECC, Defra and NERC, found that to avoid the most dangerous climate changes we would need global emissions to peak in the near future and then decline. Scientific and economic uncertainties mean it's not possible to provide a single precise date when emissions need to peak, but the later they peak, the more rapid emissions reductions or reliance on untested technologies in the future.

The IPCC report says that in order to achieve reductions, energy requirements would need to be met through a combination of technologies such as renewables, nuclear power and using carbon capture and storage on much of the remaining fossil fuel use. Reduction in demand, e.g. through more efficient use of energy, is also likely to be important.

A major unknown is the capacity for artificial greenhouse gas removal, which allows more flexibility in the amount of fossil fuel emissions, but there is great uncertainty around the potential size of the removal and its side effects.

These findings will be important to the ongoing international negotiations on future climate hosted by the UN . In the UK, the National Climate Capability, led by the Met Office, will continue to provide the latest impartial evidence needed to inform both mitigation and adaptation plans.

Professor Jason Lowe, Head of Mitigation Advice at the Met Office and lead scientist on the AVOID1 and AVOID2 programmes said: "The IPCC 5th assessment has helped us to better understand what it will take to limit future warming. The WGIII report outlines the future pathways of greenhouse emissions that will be needed to achieve this, and the types of technologies that might be available to do it".

You can see the full Summary for Policy Makers of the AR5 WGIII report online from the IPCC website .

Last updated: 14 April 2014